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(54) TIRE VULCANIZING EQUIPMENT

REIFENVULKANISIERVORRICHTUNG

ÉQUIPEMENT DE VULCANISATION DE PNEU

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Description

TECHNICAL FIELD

[0001] The present invention relates to the fields of tire vulcanizing machines and rubber vulcanizing apparatuses, in particular to tire vulcanizing equipment.

BACKGROUND

[0002] Currently, tires are generally vulcanized by using a combination of saturated steam and nitrogen. Such a vulcanizing process particularly begins with the introduction of saturated steam into a vulcanizing bladder to provide heat needed for vulcanization.

[0003] However, with the energy shortage, rising steam prices and the "double carbon target" raised, electric heating vulcanizing machines are gradually applied, which are based on the principle of providing heater and fan or other disturbing components inside the bladder of the vulcanizing machine, and the motor or other driving device drives the fan or other disturbing components to rotate, to produce a uniform high temperature and high pressure environment inside the vulcanizing bladder.

[0004] However, the high temperature and high pressure environment will damage the motor, resulting in a shortened service life of the motor.

[0005] Patent document JP 2006 022644 A discloses a tyre vulcanising apparatus provided with a sealing hood and a magnetic drive transmitting through it.

SUMMARY

[0006] Therefore, the technical problem to be solved by the present invention is to overcome the defects in the prior art that the motor has a shortened service life for it is subjected to high temperature and high pressure environment, and thus a tire vulcanizing equipment is provided.

[0007] In order to solve the above problem, the present invention provides a tire vulcanizing equipment according to claim 1.

[0008] The present invention has following advantages:

1. By means of the provision of the sealing hood, high temperature and high pressure gas is isolated and the driving motor is isolated outside the sealing hood, avoiding the problem of shortened service life of the driving motor due to the high temperature and high pressure gas, and thus increasing the service life of the driving motor by more than 60%,
2. By means of the provision of the sealing hood, the driving motor is not directly connected to the rotating shaft, avoiding the problems of high temperature, leakage and easy damage of the rotary seal, and also avoiding the influence of high temperature and high pressure on the service life of the driving motor, and further increase the service life of the driving motor.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] In order to more clearly illustrate the technical solutions in the specific embodiments or prior art of the present invention, accompanying drawings that need to be used in the description of the specific embodiments or prior art are briefly described in the following. It is obvious that the accompanying drawings in the following description are some of the embodiments of the present invention, and that other drawings can be obtained on the basis of these accompanying drawings without any creative work for those skilled in the art.

FIG. 1 illustrates an overall schematic diagram of the tire vulcanizing equipment of a first embodiment of the present invention;

FIG. 2 illustrates a partial schematic diagram of the tire vulcanizing equipment of the first embodiment of the present invention;

FIG. 3 illustrates an enlarged view at part A in FIG. 2;

FIG. 4 illustrates a schematic diagram of one implementation of the first magnetic body and the second magnetic body radially disposed of the first embodiment of the present invention;

FIG. 5 illustrates an enlarged view at part B in FIG. 4;

FIG. 6 illustrates a schematic diagram of another implementation of the first magnetic body and the second magnetic body radially disposed of the first embodiment of the present invention;

FIG. 7 illustrates an enlarged view at part C in FIG. 6;

FIG. 8 illustrates an overall schematic diagram of the tire vulcanizing equipment of a second embodiment of the present invention;

FIG. 9 illustrates a schematic diagram of one implementation of the first magnetic body and the second magnetic body radially disposed at the sealing hood of the second embodiment of the present invention;

FIG. 10 illustrates a schematic diagram of another implementation of the first magnetic body and the second magnetic body radially disposed at the sealing hood of the second embodiment of the present invention;

FIG. 11 illustrates a schematic diagram of one implementation of the first magnetic body and the

second magnetic body axially disposed at the sealing hood of the second embodiment of the present invention.

[0010] Reference List: 1 mold assembly; 2 ring seat assembly; 3 cylinder body; 4 center rod; 5 driving motor; 6 sealing hood; 11 upper mold; 12 lower mold; 13 vulcanizing bladder; 14 upper chuck; 15 upper compression ring; 16 lower chuck; 17 lower steel ring; 21 gas circulating fan; 211 mating convex portion; 22 heating medium vent; 23 heater; 24 ring seat; 31 transmission box; 311 first shaft body; 32 rotating shaft; 321 annular flange; 322 accommodating concave portion; 51 second shaft body; 52 motor hood; 61 first magnetic body; 62 second magnetic body; 63 first seal; 64 second seal; 65 third seal; 66 fourth seal; 7 fixing component.

DETAILED DESCRIPTION

[0011] The technical solutions of the present invention will be clearly and completely described below in conjunction with the accompanying drawings. Apparently, the described embodiments are some of the embodiments of the present invention, not all of them. Based on the embodiments of the present invention, all other embodiments obtained by those skilled in the art without making creative efforts fall into the protection scope of the present invention.

[0012] In the description of the present invention, it should be noted that the orientation or positional relationship indicated by the terms "center", "upper", "lower", "left", "right", "vertical", "horizontal", "inside", "outside" and the like are based on the orientation or positional relationships shown in the accompanying drawings and are intended only to facilitate and simplify the description of the invention instead of indicating or implying that the device or element referred to must have a particular orientation, must be constructed and operated in a particular orientation, and therefore shall not be construed as limiting the invention. Furthermore, the terms "first", "second" and "third" are used for descriptive purposes only and shall not be construed as indicating or implying relative importance.

[0013] In the description of the present invention, it is to be noted that, unless otherwise expressly specified and limited, the terms "mount", "connect", "couple" shall be understood in a broad sense. For example, it can be a fixed connection, a removable connection, or an integral connection; it can be a mechanical connection or an electrical connection; it can be a direct connection or an indirect connection through an intermediate medium, and it can be a connection within two elements. Those skilled in the art can understand the specific meanings of the above terms in the present invention according to specific situations.

[0014] In addition, the technical features involved in the different embodiments of the invention described below can be combined with each other as long as they do not conflict to each other.

First Embodiment

[0015] Referring to FIG. 1, the present invention discloses a tire vulcanizing equipment comprising a mold assembly 1, a ring seat assembly 2 provided on the inside of the mold assembly 1, a cylinder assembly supporting the ring seat assembly 2, a driving member and a transmission assembly, the ring seat assembly 2 being provided with a gas circulating fan 21, the driving member driving the gas circulating fan 21 via the transmission assembly, the cylinder assembly comprising a cylinder body 3 and a transmission box 31 provided on the cylinder body 3.

[0016] Referring to FIGS. 1 and 2, the mold assembly 1 is a two-half mold, and may also be a two-half segment mold, an upper open segment mold or a lower open segment mold. Particularly, the mold assembly 1 comprises an upper mold 11 and a lower mold 12, and the mold assembly 1 is also provided with a vulcanizing bladder 13 inside it for molding the tire. The ring seat assembly 2 is located inside the vulcanizing bladder 13, and is provided with a heating medium vent 22. The heating medium is preferably nitrogen. The ring seat assembly 2 is provided with a gas circulation fan 21 and a heater 23 which may be an electric heating tube, an induction heater, an infrared heater, a heat exchanger, etc. The heater 23 heats the heating medium, and the gas circulating fan 21 drives the flow of the heating medium to flow, ensuring efficient heat transfer to the vulcanizing bladder 13 and uniform temperature inside the vulcanizing bladder 13, to facilitate tire molding. The gas circulating fan may be an impeller, axial fan, etc.

[0017] Referring to FIGS. 1 and 2, the tire vulcanizing equipment further comprises a center rod 4 threaded through the ring seat assembly 2. The mold assembly 1 further comprises an upper chuck 14, an upper compression ring 15, a lower chuck 16, and a lower steel ring 17, wherein the upper chuck 14 and the upper compression ring 15 clamp the upper edge of the vulcanizing bladder 13, and the lower chuck 16 and the lower steel ring 17 clamp the lower edge of the vulcanizing bladder 13. The lower chuck 16 is fixed to the ring seat assembly 2, and more particularly, the ring seat assembly 2 comprises a ring seat 24, and the lower chuck 16 is threadedly connected to the ring seat 24 and sealed with the ring seat 24 by a seal, which may be a sealing ring. The top end of the center rod 4 is threaded to the upper chuck 14 and is fixedly connected to, such as bolted to the upper chuck 14, and the top end of the center rod 4 is sealed to the upper chuck 14 by a seal, which may be a seal ring. The sealing system is formed by the inside of the mold assembly 1, the vulcanizing bladder 13, the ring seat assembly 2, and the cylinder assembly, and the driving member is provided outside the sealing system to reduce the damage to the driving member by the high temperature and high pressure environment inside the sealing

system.

[0018] Referring to FIGS. 1 and 2, the ring seat 24 and the cylinder body 3 can be provided as an integral structure, or they can also be bolted together and can also be sealed by a seal therebetween, the seal may be a sealing ring.

[0019] The transmission box 31 and the cylinder body 3 can be provided as an integral structure, or of course they can also be bolted together and sealed by a seal therebetween, the seal may be a sealing ring. Referring to FIG. 1 and 2, the driving member is a driving motor 5, or it can be a combustion engine. Here the preferred solution is a driving motor 5. The driving motor 5 drives the rotating shaft 32 to rotate, and in turn drives the gas circulating fan 21. The sealing system comprises a sealing hood 6, the material of which can be Hastelloy, titanium alloy, etc. The sealing hood 6 can function for sealing, magnetic conductivity and reducing eddy current of magnetic field. The sealing hood 6 is provided on the ring seat assembly 2 and is located between the gas circulating fan 21 and the rotating shaft 32, the gas circulating fan 21 can rotate unimpeded relative to the sealing hood 6, and the rotating shaft 32 drives the gas circulating fan 21 via magnetic members. Wherein a first seal 63 is provided between the sealing hood 6 and the center rod, and a second seal 64 is provided between the seal hood 6 and the ring seat, both the first seal 63 and the second seal 64 being sealing rings.

[0020] Referring to FIGS. 2 and 3, the magnetic members particularly comprise a first magnetic body 61 provided at the bottom of the gas circulating fan 21 and a second magnetic body 62 provided at the top of the rotating shaft 32, wherein both the first magnetic body 61 and the second magnetic body 62 are magnets, particularly permanent magnets, and the first magnetic body 61 and the second magnetic body 62 have opposite magnetic poles. Further, the top end of the rotating shaft 32 is provided with an annular flange 321 on which the second magnetic body 62 is provided, and the first magnetic body 61 and the second magnetic body 62 are positioned so that they correspond in the upper and lower positions, that is, the first magnetic body 61 and the second magnetic body 62 are disposed along the axial direction of the rotating shaft 32. Wherein, the sealing hood 6 is located between the top end of the rotating shaft 32 and the gas circulating fan 21, the sealing hood 6 is sleeved on the center rod 4, a sealing ring is provided between the sealing hood 6 and the center rod 4, and a sealing ring is provided between the sealing hood 6 and the ring seat 24 for sealing.

[0021] Referring to FIGS. 4 and 5, in an alternative implementation, the first magnetic body 61 and the second magnetic body 62 may also be positioned in a horizontal direction in correspondence, that is, the first magnetic body 61 and the second magnetic body 62 are arranged along the radial direction of the rotating shaft 32. In particular, the top of the rotating shaft 32 is provided with an accommodating concave portion 322, and the middle part of the bottom end of the gas circulating fan 21 is provided with a cooperating convex portion 211, where the shape of the sealing hood 6 is adapted to the gap between the accommodating concave portion 322 and the cooperating convex portion 211. During installation, the cooperating convex portion 211 extends into the accommodating concave portion 322, the first magnetic body 61 is arranged on the side wall of the cooperating convex portion 211, and the second magnetic body 62 is arranged on the side wall of the accommodating concave portion 322.

[0022] Referring to FIGS. 6 and 7, in another embodiment in which the first magnetic member and the second magnetic member are arranged in the radial direction of the rotating shaft 32, the concave-convex fit of the top end of the rotating shaft 32 and the gas circulating fan 21 changes, that is, the top end of the rotating shaft 32 is provided with a cooperating convex portion 211 and the middle part of the bottom surface of the gas circulating fan 21 is provided with an accommodating concave portion 322, and the sealing hood 6 is shaped to fit with the gap between the cooperating convex portion 211 and the accommodating concave portion 322. During installation, the accommodating concave portion 322 extends into the cooperating convex portion 211, the first magnetic body 61 is arranged on the side wall of the accommodating concave portion 322, and the second magnetic body 62 is arranged on the side wall of the cooperating convex portion 211.

[0023] The implementation principle of the embodiment of the present invention is that at the beginning of tire vulcanizing, nitrogen is charged into the interior of the vulcanizing bladder 13 through the heating medium vent 22 to provide internal pressure to the vulcanizing bladder 13, and the heater 23 generates heat to provide heat to the vulcanizing bladder 13. The driving motor 5 is operated such that the output shaft of the driving motor 5 drives the rotating shaft 32 to rotate, and the gas circulating fan 21 works by means of the attraction of the first magnetic body 61 and the second magnetic body 62, to urge nitrogen circulation inside the vulcanizing bladder 13, thus improving the temperature uniformity. Among them, the driving motor 5 is isolated outside the sealing system by the sealing hood 6, such that the driving motor 5 works in a low temperature and pressure-free environment, reducing the damage to the driving motor 5, thus improving the service life of the driving motor 5.

Second Embodiment

[0024] The difference between the second embodiment and the first embodiment is that the first magnetic body 61 and the second magnetic body 62 are provided in different positions. Referring to FIGS. 8 and 9, the transmission assembly comprises a first transmission member and a second transmission member, the first transmission member being a first shaft body 311 and the second transmission member being a second shaft body

51. The tire vulcanizing equipment further comprises a transmission box 31 provided on the cylinder body 3 with a rotating shaft 32 threading through the transmission box 31, the rotating shaft 32 being a hollow shaft sleeved on the center rod 4 and provided in the cylinder body 3, the top end of the rotating shaft 32 being connected to and driving the gas circulating fan 21 to rotate. The first shaft body 311 is provided in the transmission box 31. The first shaft body 311 and the rotating shaft 32 are engaged by means of gears, or may be driven by belts or sprockets. In this solution, they are preferably gear meshed.

[0025] The lower end of the transmission box 31 and the center rod 4 may be sealed by a seal, or the lower end of the transmission box 31 and a fixed component 7 outside of the center rod 4 are sealed by a fourth seal 66. The fixed component 7 may be a cylinder block and the seal may be a sealing ring.

[0026] Referring to FIGS. 8 and 9, the driving motor 5 is fixed to the transmission box 31, and the tire vulcanizing equipment further comprises a motor hood 52, one end of the motor hood 52 being connected to the transmission box 31, and the other end of the motor hood 52 being connected to the driving motor 5, and the way of connection can be bolted or welded. The output shaft of the driving motor 5 is also connected to a second shaft body 51, which may be connected by screws or couplings. The sealing hood 6 is provided on the transmission box 31 to separate the first shaft body 311 and the second shaft body 51 apart, and both the second shaft body 51 and the sealing hood 6 are located inside the motor hood 52. The axis of the first shaft body 311 and the second shaft body 51 are the same. In this sulution, the first shaft body 311 and the second shaft body 51 are connected by magnetic components, so that the second shaft body 51 can drive the first shaft body 311 to rotate.

[0027] In particular, the first magnetic body 61 is provided on the first shaft body 311, the second magnetic body 62 is provided on the second shaft body 51, wherein the first shaft body 311 projects outwardly, the end of the second shaft body 51 is recessed near the first shaft body 311 to form an accommodating concave portion 322, and the second magnetic body 62 is located on the side wall of the accommodating concave portion 322 to cover the projecting end of the first shaft body 311, such that the first magnetic body 61 is provided radially opposite to the second magnetic body 62 relative to the first shaft body 311, and with the attraction of the first magnetic body 61 to the second magnetic body 62, when the driving motor 5 drives the second shaft body 51 to rotate, the second shaft body 51 can follow the rotation, and in turn transmit the movement to the rotating shaft 32 which drives the gas circulating fan 21 to rotate. There is also a third seal 65 provided between the sealing hood 6 and the transmission box 31, and the third seal 65 seals the gap between the sealing hood 6 and the transmission box 31. The third seal 65 is preferably a sealing ring.

[0028] In another embodiment, referring to FIGS. 8 and 10, the concave-convex fit between the first shaft body 311 and the second shaft body 51 is also interchangeable, that is, the end of the first shaft body 311 near the second shaft body 51 is provided with an accommodating concave portion 322, and the end of the second shaft body 51 near the first shaft body 311 is provided with a cooperating convex portion 211, and when the first shaft body 311 and the second shaft body 51 fit to each other, the cooperating convex portion 211 is located in the accommodating concave portion 322. Wherein, the first magnetic body 61 is provided on the side wall of the accommodating concave portion 322, the second magnetic body 62 is provided on the side wall of the cooperating convex portion211, and the first magnetic body 61 and the second magnetic body 62 are provided side by side in the radial direction of the first shaft body 311.

[0029] The implementation principle of this embodiment of the present invention is that at the beginning of tire vulcanizing, nitrogen is charged into the interior of the vulcanizing bladder 13 through the heating medium vent 22 to provide internal pressure to the vulcanizing bladder 13, and the heater 23 generates heat to provide heat to the vulcanizing bladder 13. The driving motor 5 is operated such that the output shaft of the driving motor 5 drives the rotating shaft 32 to rotate, and by means of the attraction of the first magnetic body 61 and the second magnetic body 62, the second shaft 51 drives the first shaft 311 to rotate, and the first shaft 311 drives the rotating shaft 32 by means of the engagement of the gears to rotate the rotating shaft 32, so that the rotating shaft 32 rotates together, and the rotating shaft 32 then drives the gas circulating fan 21 to work, urging the nitrogen circulation inside the vulcanizing bladder 13 and improving the temperature uniformity. Wherein, the driving motor 5 is isolated outside the sealing system by the sealing hood 6, which reduces the damage to the driving motor 5.

[0030] In another embodiment, the first magnetic body 61 and the second magnetic body 62 are provided at different positions. Referring to FIG. 11, particularly, the first shaft body 311 and the second shaft body 51 are provided coaxially, the sealing hood 6 separates the first shaft body 311 and the second shaft body 51 apart, the first magnetic body 61 is provided at the end of the first shaft body 311 near the second shaft body 51, and the second magnetic body 62 is provided at the end of the second shaft body 51 near the first shaft body 311. At this time, the first axis body 311 and the second axis body 51 are axially facing each other. When the second shaft body 51 rotates, the first shaft body 311 is rotated by means of magnetic attraction between the first magnetic body 61 and the second magnetic body 62.

Claims

1. A tire vulcanizing equipment comprising:

a mold assembly (1) provided with a vulcanizing

bladder (13) inside of the mold assembly for tire molding;
a ring seat assembly (2) provided inside the mold assembly (1), the ring seat assembly (2) being provided with a gas circulating fan (21), the ring seat assembly (2) is provided with a heating medium vent (22);
a cylinder assembly provided on the ring seat assembly (2), the cylinder assembly having a rotating shaft (32) provided within the cylinder assembly, the rotating shaft (32) being adapted to drive the gas circulating fan (21) to rotate;
a driving member adapted to drive the rotating shaft (32) to rotate;
a sealing hood (6) adapted to seal off gas inside the mold assembly (1);
wherein the sealing hood (6) is provided on the ring seat assembly (2) and is located between the gas circulating fan (21) and the rotating shaft (32), the rotating shaft (32) driving the gas circulating fan (21) to rotate by means of magnetic members;
the magnetic members comprising a first magnetic body (61) provided on the gas circulating fan (21) and a second magnetic body provided on the rotating shaft (32), the first magnetic body (61) and the second magnetic body being provided correspondingly;
the tire vulcanizing equipment further comprising a center rod (4) threaded through the ring seat assembly (2), the ring seat assembly (2) comprising a ring seat (24) and a heater (23);
characterised in that either
the sealing hood (6) is located between the top end of the rotating shaft (32) and the gas circulating fan (21), the sealing hood (6) is sleeved on the center rod (4); a first seal (63) is provided between the sealing hood (6) and the center rod (4), and a second seal (64) is provided between the sealing hood (6) and the ring seat (24);
a sealing system is formed by the inside of the mold assembly (1), the vulcanizing bladder (13), the ring seat assembly (2), and the cylinder assembly, and the driving member is provided outside the sealing system;
or **in that**
the sealing hood (6) is provided on the cylinder assembly and is located between the rotating shaft (32) and the driving member, the driving member driving the rotating shaft (32) to rotate by means of magnetic members;
the cylinder assembly comprises a cylinder body (3) and a transmission box (31) provided on the cylinder body (3), the sealing hood (6) being provided on the transmission box (31) and sealing the inner and outer space of the transmission box (31), wherein a first transmission member driving the rotating shaft (32) to rotate is provided inside the transmission box (31), and a second transmission member is provided outside the transmission box (31), the driving member being connected to the second transmission member, the first transmission member and the second transmission member being located on either side of the sealing hood (6) respectively; and the magnetic members comprise a first magnetic body (61) provided on the first transmission member and a second magnetic body provided on the second transmission member, the first magnetic body (61) and the second magnetic body being provided correspondingly;
the first transmission member comprises a first shaft body (311) connected to the rotating shaft (32) through a gear mechanism, and the second transmission member comprises a second shaft body (51) connected to an output shaft of the driving member;
the sealing hood (6) is provided on the transmission box (31) to separate the first shaft body (311) and the second shaft body (51) apart; a third seal (65) is provided between the sealing hood (6) and the cylinder assembly.

2. The tire vulcanizing equipment according to claim 1, **characterized in that** the end of the rotating shaft (32) is provided with an annular flange (321), wherein the first magnetic body (61) is provided on the bottom wall of the gas circulating fan (21), the second magnetic body is provided on the annular flange (321), and the first magnetic body (61) and second magnetic body are arranged along the axial direction of the rotating shaft (32).

3. The tire vulcanizing equipment according to claim 1, **characterized in that** an end of the rotating shaft (32) is provided with an accommodating concave portion (322) and a middle part of the gas circulating fan (21) is provided with a cooperating convex portion (211), the shape of the sealing hood (6) being adapted to the accommodating concave portion (322) and the cooperating convex portion (211), the cooperating convex portion (211) extending into the accommodating concave portion (322), wherein the first magnetic body (61) is provided on the side wall of the cooperating convex portion (211) and the second magnetic body is provided on the side wall of the accommodating concave portion (322), the first magnetic body (61) and the second magnetic body being arranged along the radial direction of the rotating shaft (32).

4. The tire vulcanizing equipment according to claim 1, **characterized in that** an end of the rotating shaft (32) is provided with a cooperating convex portion (211) and a middle part of the gas circulating fan (21) is provided with an accommodating concave portion

(322), the shape of the sealing hood (6) being adapted to the cooperating convex portion (211) and the accommodating concave portion (322), the accommodating concave portion (322) extending into the cooperating convex portion (211), wherein the first magnetic body (61) is provided on the side wall of the accommodating concave portion (322) and the second magnetic body is provided on the side wall of the cooperating convex portion (211), the first magnetic body (61) and the second magnetic body being arranged along the radial direction of the rotating shaft (32).

5. The tire vulcanizing equipment according to claim 1, **characterized in that** the first magnetic body (61) is provided on the end face of the first shaft body (311) and the second magnetic body is provided on the end face of the second shaft body (51), both of which are arranged along the axial direction of the first shaft body (311).

6. The tire vulcanizing equipment according to claim 1, **characterized in that** the sealing hood (6) projects toward the outside of the transmission box (31), the first shaft body (311) extends into the sealing hood (6), the second shaft body (51) is provided with an accommodating concave portion (322) on its end face, the sealing hood (6) extends into the accommodating concave portion (322), the first magnetic body (61) is provided on the side wall of the first shaft body (311), the second magnetic body is provided on the side wall of the accommodating concave portion (322), and the first magnetic body (61) and the second magnetic body are arranged along the radial direction of the first shaft body (311).

7. The tire vulcanizing equipment according to claim 5 or 6, **characterized in that** the driving member is a driving motor (5), and the tire vulcanizing equipment further comprises a motor hood (52), one end of the motor hood (52) being connected to the transmission box (31), the other end of the motor hood (52) being connected to the driving motor (5), the sealing hood (6) and second shaft body (51) both being located within the motor hood (52).

Patentansprüche

1. Reifenvulkanisiervorrichtung, umfassend:

eine Formanordnung (1), die mit einem Vulkanisationsbalg (13) innerhalb der Formanordnung zum Reifenformen versehen ist;
eine Ringsitzanordnung (2), die innerhalb der Formanordnung (1) vorgesehen ist, wobei die Ringsitzanordnung (2) mit einem Gasumwälzgebläse (21) versehen ist, wobei die Ringsitzanordnung (2) mit einer Heizmediumlüftung (22) versehen ist;
eine Zylinderanordnung, die an der Ringsitzanordnung (2) vorgesehen ist, wobei die Zylinderanordnung eine Drehwelle (32) aufweist, die innerhalb der Zylinderanordnung vorgesehen ist, wobei die Drehwelle (32) zum Drehantrieb des Gasumwälzgebläses (21) ausgeführt ist;
ein Antriebselement, das zum Drehantrieb der Drehwelle (32) ausgeführt ist;
eine Dichtungshaube (6), die dazu ausgeführt ist, Gas innerhalb der Formanordnung (1) einzuschließen;
wobei die Dichtungshaube (6) an der Ringsitzanordnung (2) vorgesehen ist und sich zwischen dem Gasumwälzgebläse (21) und der Drehwelle (32) befindet, wobei die Drehwelle (32) das Gasumwälzgebläse (21) mittels magnetischer Elemente zur Drehung antreibt;
wobei die magnetischen Elemente einen ersten Magnetkörper (61), der an dem Gasumwälzgebläse (21) vorgesehen ist, und einen zweiten Magnetkörper, der an der Drehwelle (32) vorgesehen ist, umfassen, wobei der erste Magnetkörper (61) und der zweite Magnetkörper entsprechend vorgesehen sind;
wobei die Reifenvulkanisationsvorrichtung ferner eine Mittelstange (4) umfasst, die durch die Ringsitzanordnung (2) geschraubt ist, wobei die Ringsitzanordnung (2) einen Ringsitz (24) und eine Heizung (23) umfasst; **dadurch gekennzeichnet, dass** entweder
die Dichtungshaube (6) sich zwischen dem oberen Ende der Drehwelle (32) und dem Gasumwälzgebläse (21) befindet, die Dichtungshaube (6) auf der Mittelstange (4) aufgeschoben ist;
eine erste Dichtung (63) zwischen der Dichtungshaube (6) und der Mittelstange (4) vorgesehen ist und eine zweite Dichtung (64) zwischen der Dichtungshaube (6) und dem Ringsitz (24) vorgesehen ist;
ein Dichtungssystem durch das Innere der Formanordnung (1), den Vulkanisationsbalg (13), die Ringsitzanordnung (2) und die Zylinderanordnung gebildet wird und das Antriebselement außerhalb des Dichtungssystems vorgesehen ist;
oder dass
die Dichtungshaube (6) an der Zylinderanordnung vorgesehen ist und sich zwischen der Drehwelle (32) und dem Antriebselement befindet, wobei das Antriebselement die Drehwelle (32) mittels magnetischer Elemente zur Drehung antreibt;
die Zylinderanordnung einen Zylinderkörper (3) und einen Getriebekasten (31), der an dem Zylinderkörper (3) vorgesehen ist, umfasst, wobei die Dichtungshaube (6) an dem Getriebe-

kasten (31) vorgesehen ist und den Innen- und Außenraum des Getriebekastens (31) abdichtet, wobei ein erstes Übertragungselement, das die Drehwelle (32) zum Drehen antreibt, innerhalb des Getriebekastens (31) vorgesehen ist und ein zweites Übertragungselement außerhalb des Getriebekastens (31) vorgesehen ist, wobei das Antriebselement mit dem zweiten Übertragungselement verbunden ist, wobei sich das erste Übertragungselement und das zweite Übertragungselement jeweils auf beiden Seiten der Dichtungshaube (6) befinden; und die Magnetelemente einen ersten Magnetkörper (61), der an dem ersten Übertragungselement vorgesehen ist, und einen zweiten Magnetkörper, der an dem zweiten Übertragungselement vorgesehen ist, umfassen, wobei der erste Magnetkörper (61) und der zweite Magnetkörper entsprechend vorgesehen sind;
das erste Übertragungselement einen ersten Wellenkörper (311) umfasst, der durch einen Getriebemechanismus mit der Drehwelle (32) verbunden ist, und das zweite Übertragungselement einen zweiten Wellenkörper (51) umfasst, der mit einer Ausgangswelle des Antriebselements verbunden ist;
die Dichtungshaube (6) am Getriebekasten (31) vorgesehen ist, um den ersten Wellenkörper (311) und den zweiten Wellenkörper (51) voneinander zu trennen; eine dritte Dichtung (65) zwischen der Dichtungshaube (6) und der Zylinderanordnung vorgesehen ist.

2. Reifenvulkanisiervorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** das Ende der Drehwelle (32) mit einem ringförmigen Flansch (321) versehen ist, wobei der erste Magnetkörper (61) an der Bodenwand des Gasumwälzgebläses (21) vorgesehen ist, der zweite Magnetkörper an dem ringförmigen Flansch (321) vorgesehen ist und der erste Magnetkörper (61) und der zweite Magnetkörper entlang der Axialrichtung der Drehwelle (32) angeordnet sind.

3. Reifenvulkanisiervorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** ein Ende der Drehwelle (32) mit einem konkaven Aufnahmeabschnitt (322) versehen ist und ein Mittelteil des Gasumwälzgebläses (21) mit einem zusammenwirkenden konvexen Abschnitt (211) versehen ist, wobei die Form der Dichtungshaube (6) an den konkaven Aufnahmeabschnitt (322) und den zusammenwirkenden konvexen Abschnitt (211) angepasst ist, wobei sich der zusammenwirkende konvexe Abschnitt (211) in den konkaven Aufnahmeabschnitt (322) erstreckt, wobei der erste Magnetkörper (61) an der Seitenwand des zusammenwirkenden konvexen Abschnitts (211) vorgesehen ist und der zweite Magnetkörper an der Seitenwand des konkaven Aufnahmeabschnitts (322) vorgesehen ist, wobei der erste Magnetkörper (61) und der zweite Magnetkörper entlang der radialen Richtung der Drehwelle (32) angeordnet sind.

4. Reifenvulkanisiervorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** ein Ende der Drehwelle (32) mit einem zusammenwirkenden konvexen Abschnitt (211) versehen ist und ein Mittelteil des Gasumwälzgebläses (21) mit einem konkaven Aufnahmeabschnitt (322) versehen ist, wobei die Form der Dichtungshaube (6) an den zusammenwirkenden konvexen Abschnitt (211) und den konkaven Aufnahmeabschnitt (322) angepasst ist, wobei sich der konkave Aufnahmeabschnitt (322) in den zusammenwirkenden konvexen Abschnitt (211) erstreckt, wobei der erste Magnetkörper (61) an der Seitenwand des konkaven Aufnahmeabschnitts (322) vorgesehen ist und der zweite Magnetkörper an der Seitenwand des zusammenwirkenden konvexen Abschnitts (211) vorgesehen ist, wobei der erste Magnetkörper (61) und der zweite Magnetkörper entlang der radialen Richtung der Drehwelle (32) angeordnet sind.

5. Reifenvulkanisiervorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der erste Magnetkörper (61) an der Stirnfläche des ersten Wellenkörpers (311) vorgesehen ist und der zweite Magnetkörper an der Stirnfläche des zweiten Wellenkörpers (51) vorgesehen ist, wobei beide entlang der Axialrichtung des ersten Wellenkörpers (311) angeordnet sind.

6. Reifenvulkanisiervorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Dichtungshaube (6) nach außerhalb des Getriebekastens (31) vorsteht, sich der erste Wellenkörper (311) in die Dichtungshaube (6) erstreckt, der zweite Wellenkörper (51) an seiner Stirnfläche mit einem konkaven Aufnahmeabschnitt (322) versehen ist, sich die Dichtungshaube (6) in den konkaven Aufnahmeabschnitt (322) erstreckt, der erste Magnetkörper (61) an der Seitenwand des ersten Wellenkörpers (311) vorgesehen ist, der zweite Magnetkörper an der Seitenwand des konkaven Aufnahmeabschnitts (322) vorgesehen ist und der erste Magnetkörper (61) und der zweite Magnetkörper entlang der radialen Richtung des ersten Wellenkörpers (311) angeordnet sind.

7. Reifenvulkanisiervorrichtung nach Anspruch 5 oder 6, **dadurch gekennzeichnet, dass** das Antriebselement ein Antriebsmotor (5) ist und die Reifenvulkanisiervorrichtung ferner eine Motorhaube (52) umfasst, wobei ein Ende der Motorhaube (52) mit dem Getriebekasten (31) verbunden ist, das andere Ende der Motorhaube (52) mit dem Antriebsmotor

(5) verbunden ist, wobei sich die Dichtungshaube (6) und der zweite Wellenkörper (51) beide innerhalb der Motorhaube befinden (52).

Revendications

1. Équipement de vulcanisation de pneus comprenant :

un ensemble moule (1) pourvu d'une vessie de vulcanisation (13) à l'intérieur de l'ensemble moule pour le moulage de pneus ;
un ensemble siège annulaire (2) placé à l'intérieur de l'ensemble moule (1), l'ensemble siège annulaire (2) étant pourvu d'un ventilateur de circulation de gaz (21), l'ensemble siège annulaire (2) étant pourvu d'un orifice pour fluide chauffant (22) ;
un ensemble cylindre placé sur l'ensemble siège annulaire (2), l'ensemble cylindre comportant un arbre rotatif (32) placé à l'intérieur de l'ensemble cylindre, l'arbre rotatif (32) étant propre à mettre le ventilateur de circulation de gaz (21) en rotation ;
un élément d'entraînement propre à mettre l'arbre rotatif (32) en rotation ;
une coiffe d'étanchéité (6) propre à enfermer le gaz de manière étanche à l'intérieur de l'ensemble moule (1) ;
la coiffe d'étanchéité (6) étant placée sur l'ensemble siège annulaire (2) et étant située entre le ventilateur de circulation de gaz (21) et l'arbre rotatif (32), l'arbre rotatif (32) mettant le ventilateur de circulation de gaz (21) en rotation au moyen d'éléments magnétiques ;
les éléments magnétiques comprenant un premier corps magnétique (61) placé sur le ventilateur de circulation de gaz (21) et un second corps magnétique placé sur l'arbre rotatif (32), le premier corps magnétique (61) et le second corps magnétique étant placés de manière correspondante ;
l'équipement de vulcanisation de pneus comprenant, en outre, une tige centrale (4) insérée à travers l'ensemble siège annulaire (2), l'ensemble siège annulaire (2) comprenant un siège annulaire (24) et un dispositif de chauffage (23) ; caractérisé soit en ce que
la coiffe d'étanchéité (6) est située entre l'extrémité supérieure de l'arbre rotatif (32) et le ventilateur de circulation de gaz (21), la coiffe d'étanchéité (6) est adaptée autour de la tige centrale (4) ; un premier joint d'étanchéité (63) est placé entre la coiffe d'étanchéité (6) et la tige centrale (4), et un deuxième joint d'étanchéité (64) est placé entre la coiffe d'étanchéité (6) et le siège annulaire (24) ;
un système d'étanchéité est formé par l'intérieur de l'ensemble moule (1), la vessie de vulcanisation (13), l'ensemble siège annulaire (2) et l'ensemble cylindre, et l'élément d'entraînement est placé à l'extérieur du système d'étanchéité ;
soit en ce que
la coiffe d'étanchéité (6) est placée sur l'ensemble cylindre et est située entre l'arbre rotatif (32) et l'élément d'entraînement, l'élément d'entraînement mettant l'arbre rotatif (32) en rotation au moyen d'éléments magnétiques ;
l'ensemble cylindre comprend un corps de cylindre (3) et une boîte de transmission (31) placée sur le corps de cylindre (3), la coiffe d'étanchéité (6) étant placée sur la boîte de transmission (31) et isolant l'espace intérieur et l'espace extérieur de la boîte de transmission (31), un premier élément de transmission mettant l'arbre rotatif (32) en rotation étant placé à l'intérieur de la boîte de transmission (31), et un second élément de transmission étant placé à l'extérieur de la boîte de transmission (31), l'élément d'entraînement étant raccordé au second élément de transmission, le premier élément de transmission et le second élément de transmission étant respectivement situés de chaque côté de la coiffe d'étanchéité (6) ; et
les éléments magnétiques comprennent un premier corps magnétique (61) placé sur le premier élément de transmission et un second corps magnétique placé sur le second élément de transmission, le premier corps magnétique (61) et le second corps magnétique étant placés de manière correspondante ;
le premier élément de transmission comprend un premier corps d'arbre (311) raccordé à l'arbre rotatif (32) par le biais d'un mécanisme d'engrenage, et le second élément de transmission comprend un second corps d'arbre (51) raccordé à un arbre de sortie de l'élément d'entraînement ;
la coiffe d'étanchéité (6) est placée sur la boîte de transmission (31) pour séparer l'un de l'autre le premier corps d'arbre (311) et le second corps d'arbre (51) ; un troisième joint d'étanchéité (65) est placé entre la coiffe d'étanchéité (6) et l'ensemble cylindre.

2. Équipement de vulcanisation de pneus selon la revendication 1, **caractérisé en ce que** l'extrémité de l'arbre rotatif (32) est pourvue d'une collerette annulaire (321), le premier corps magnétique (61) étant placé sur la paroi inférieure du ventilateur de circulation de gaz (21), le second corps magnétique étant placé sur la collerette annulaire (321), et le premier corps magnétique (61) et le second corps magnétique étant agencés le long de la direction axiale de l'arbre rotatif (32).

3. Équipement de vulcanisation de pneus selon la revendication 1, **caractérisé en ce qu'**une extrémité de l'arbre rotatif (32) est pourvue d'une partie réceptrice concave (322) et une partie centrale du ventilateur de circulation de gaz (21) est pourvue d'une partie coopérante convexe (211), la forme de la coiffe d'étanchéité (6) étant adaptée à la partie réceptrice concave (322) et la partie coopérante convexe (211), la partie coopérante convexe (211) s'étendant dans la partie réceptrice concave (322), le premier corps magnétique (61) étant placé sur la paroi latérale de la partie coopérante convexe (211) et le second corps magnétique étant placé sur la paroi latérale de la partie réceptrice concave (322), le premier corps magnétique (61) et le second corps magnétique étant agencés le long de la direction radiale de l'arbre rotatif (32).

4. Équipement de vulcanisation de pneus selon la revendication 1, **caractérisé en ce qu'**une extrémité de l'arbre rotatif (32) est pourvue d'une partie coopérante convexe (211) et une partie centrale du ventilateur de circulation de gaz (21) est pourvue d'une partie réceptrice concave (322), la forme de la coiffe d'étanchéité (6) étant adaptée à la partie coopérante convexe (211) et la partie réceptrice concave (322), la partie réceptrice concave (322) s'étendant dans la partie coopérante convexe (211), le premier corps magnétique (61) étant placé sur la paroi latérale de la partie réceptrice concave (322) et le second corps magnétique étant placé sur la paroi latérale de la partie coopérante convexe (211), le premier corps magnétique (61) et le second corps magnétique étant agencés le long de la direction radiale de l'arbre rotatif (32).

5. Équipement de vulcanisation de pneus selon la revendication 1, **caractérisé en ce que** le premier corps magnétique (61) est placé sur la face d'extrémité du premier corps d'arbre (311) et le second corps magnétique est placé sur la face d'extrémité du second corps d'arbre (51), les deux étant agencés le long de la direction axiale du premier corps d'arbre (311).

6. Équipement de vulcanisation de pneus selon la revendication 1, **caractérisé en ce que** la coiffe d'étanchéité (6) fait saillie vers l'extérieur de la boîte de transmission (31), le premier corps d'arbre (311) s'étend dans la coiffe d'étanchéité (6), le second corps d'arbre (51) est pourvu d'une partie réceptrice concave (322) sur sa face d'extrémité, la coiffe d'étanchéité (6) s'étend dans la partie réceptrice concave (322), le premier corps magnétique (61) est placé sur la paroi latérale du premier corps d'arbre (311), le second corps magnétique est placé sur la paroi latérale de la partie réceptrice concave (322), et le premier corps magnétique (61) et le second corps magnétique sont agencés le long de la direction radiale du premier corps d'arbre (311).

7. Équipement de vulcanisation de pneus selon la revendication 5 ou 6, **caractérisé en ce que** l'élément d'entraînement est un moteur d'entraînement (5), et l'équipement de vulcanisation de pneus comprenant, en outre, une coiffe de moteur (52), une extrémité de la coiffe de moteur (52) étant raccordée à la boîte de transmission (31), l'autre extrémité de la coiffe de moteur (52) étant raccordée au moteur d'entraînement (5), la coiffe d'étanchéité (6) et le second corps d'arbre (51) étant tous deux situés à l'intérieur de la coiffe de moteur (52).

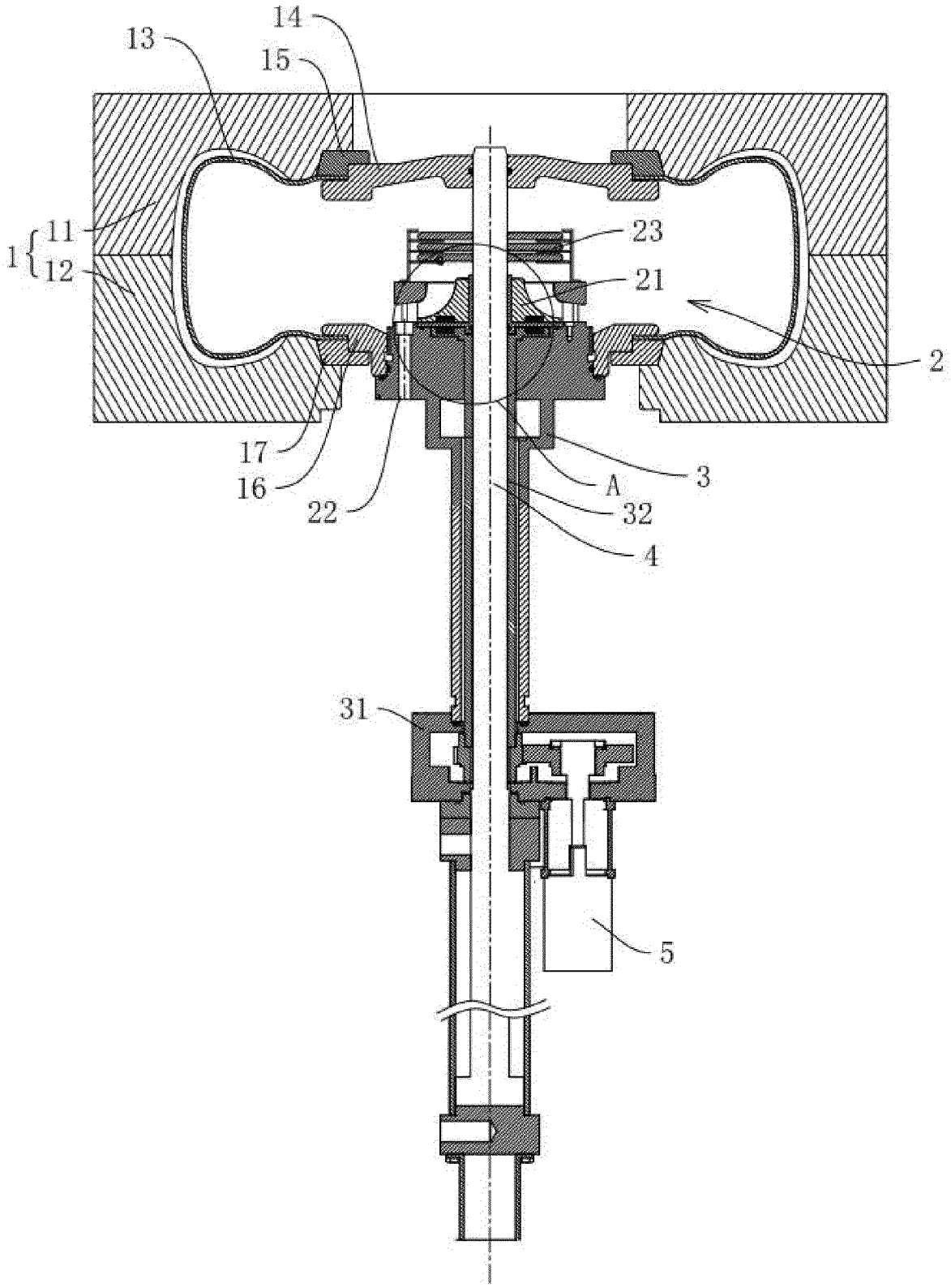


FIG. 1

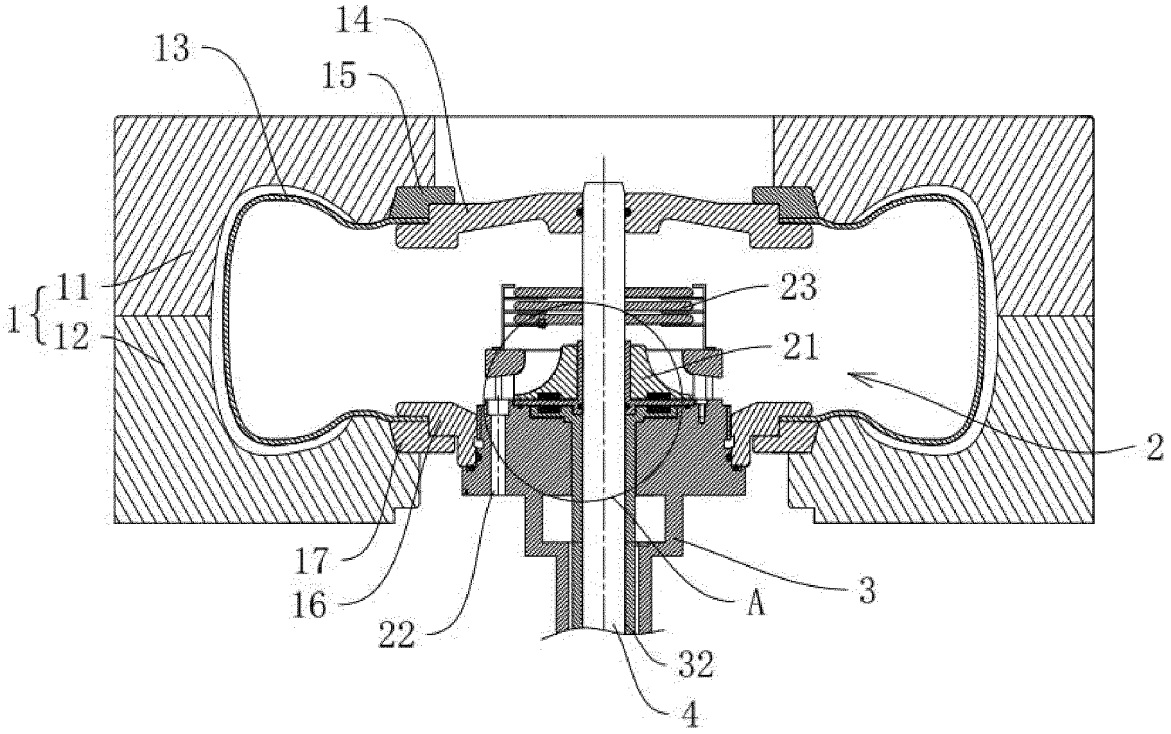


FIG. 2

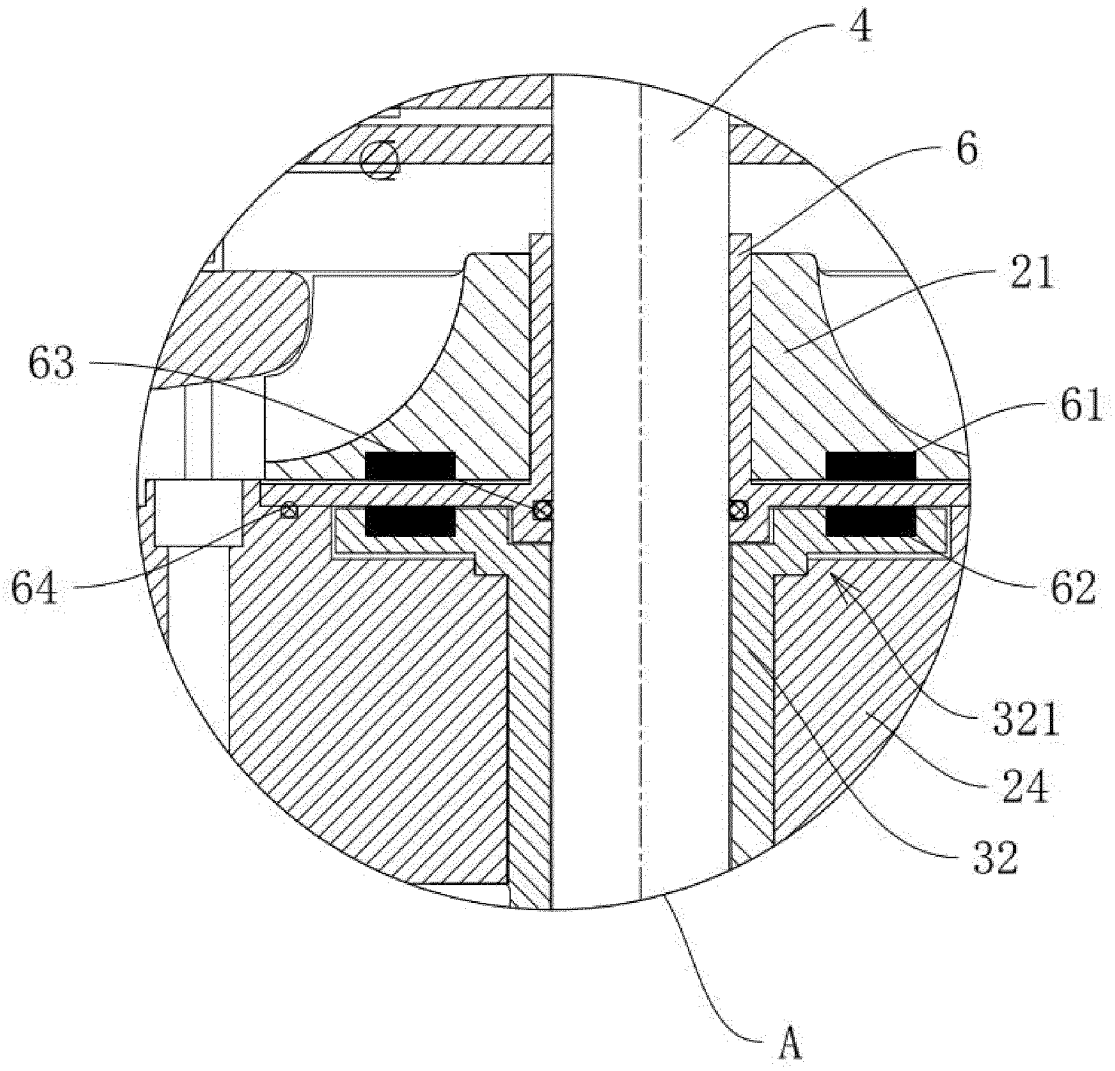


FIG. 3

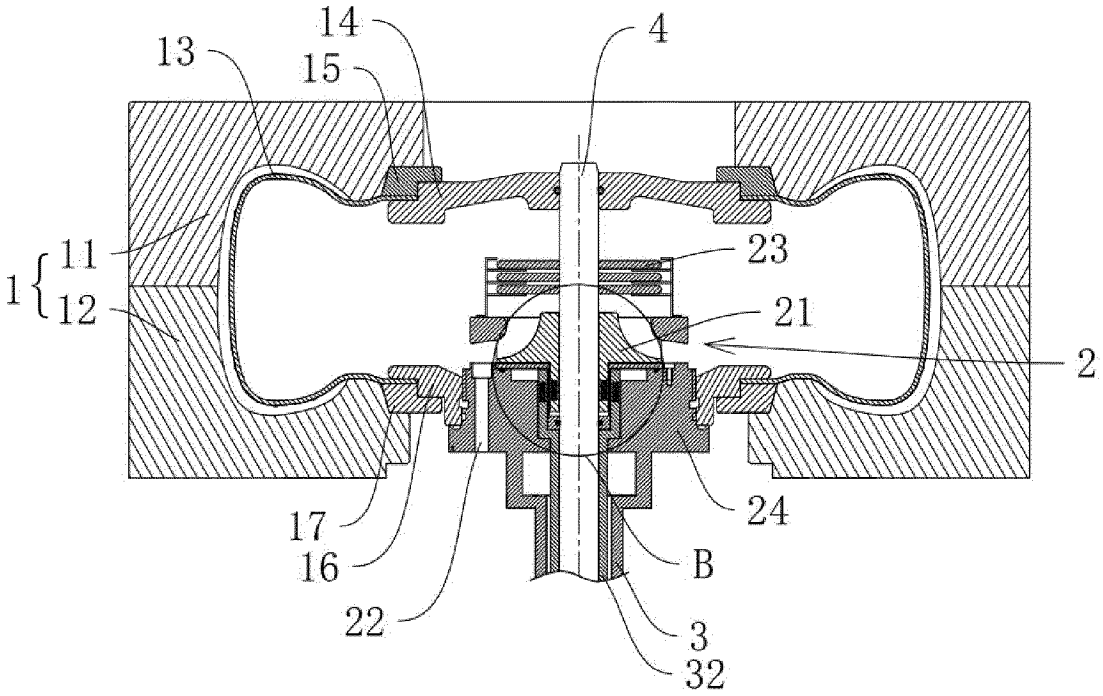


FIG. 4

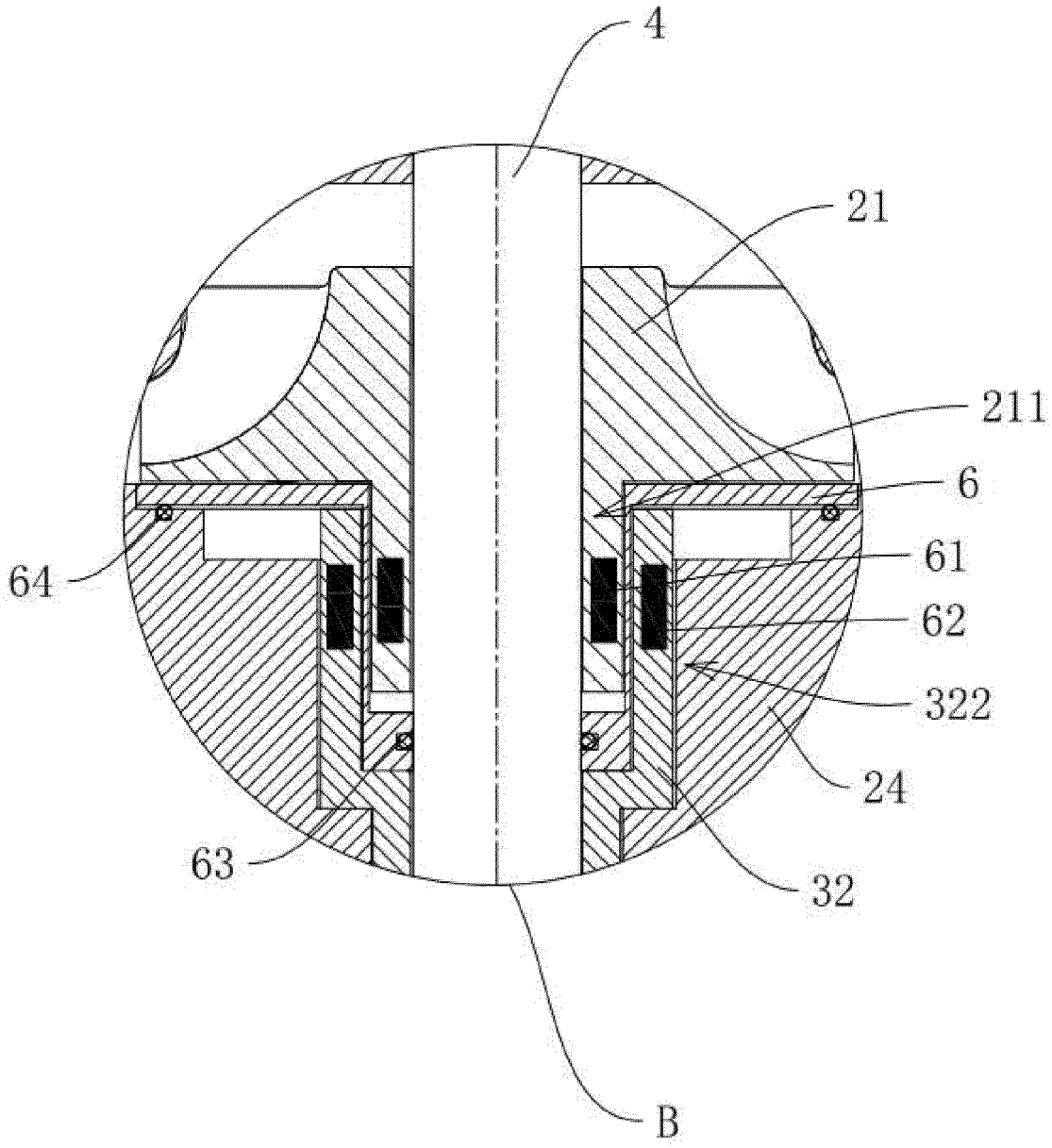


FIG. 5

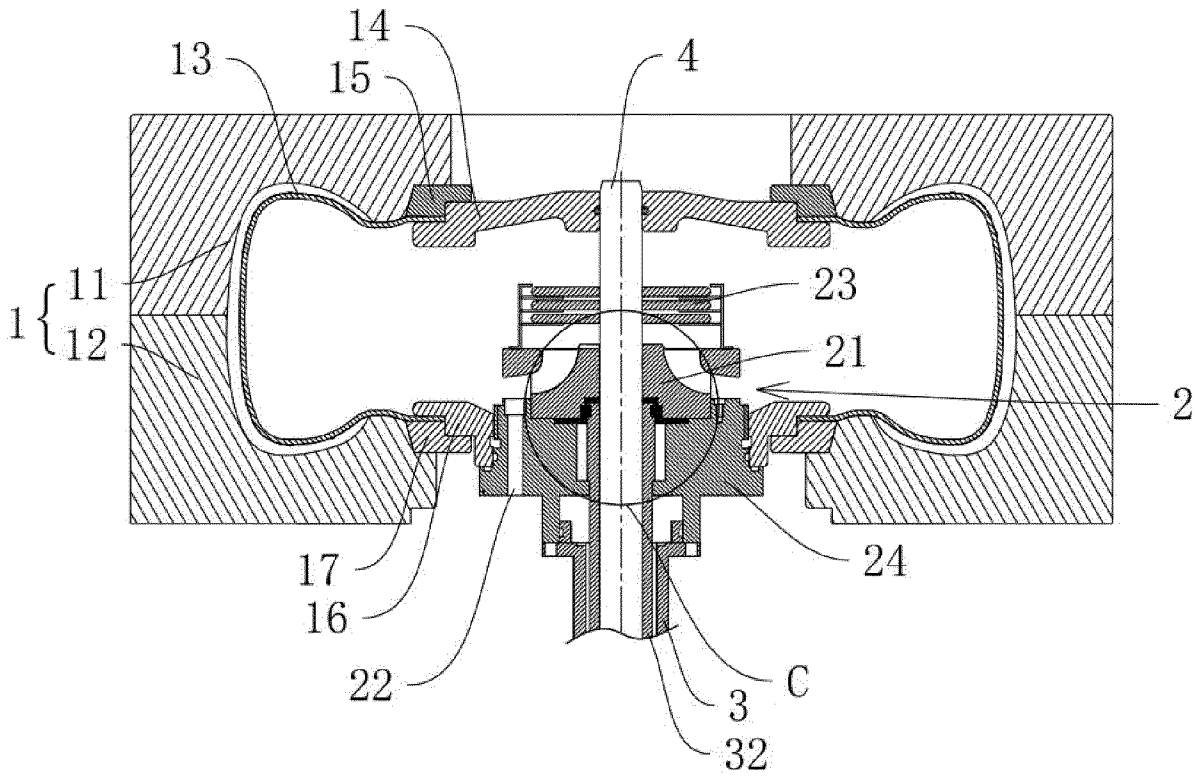


FIG. 6

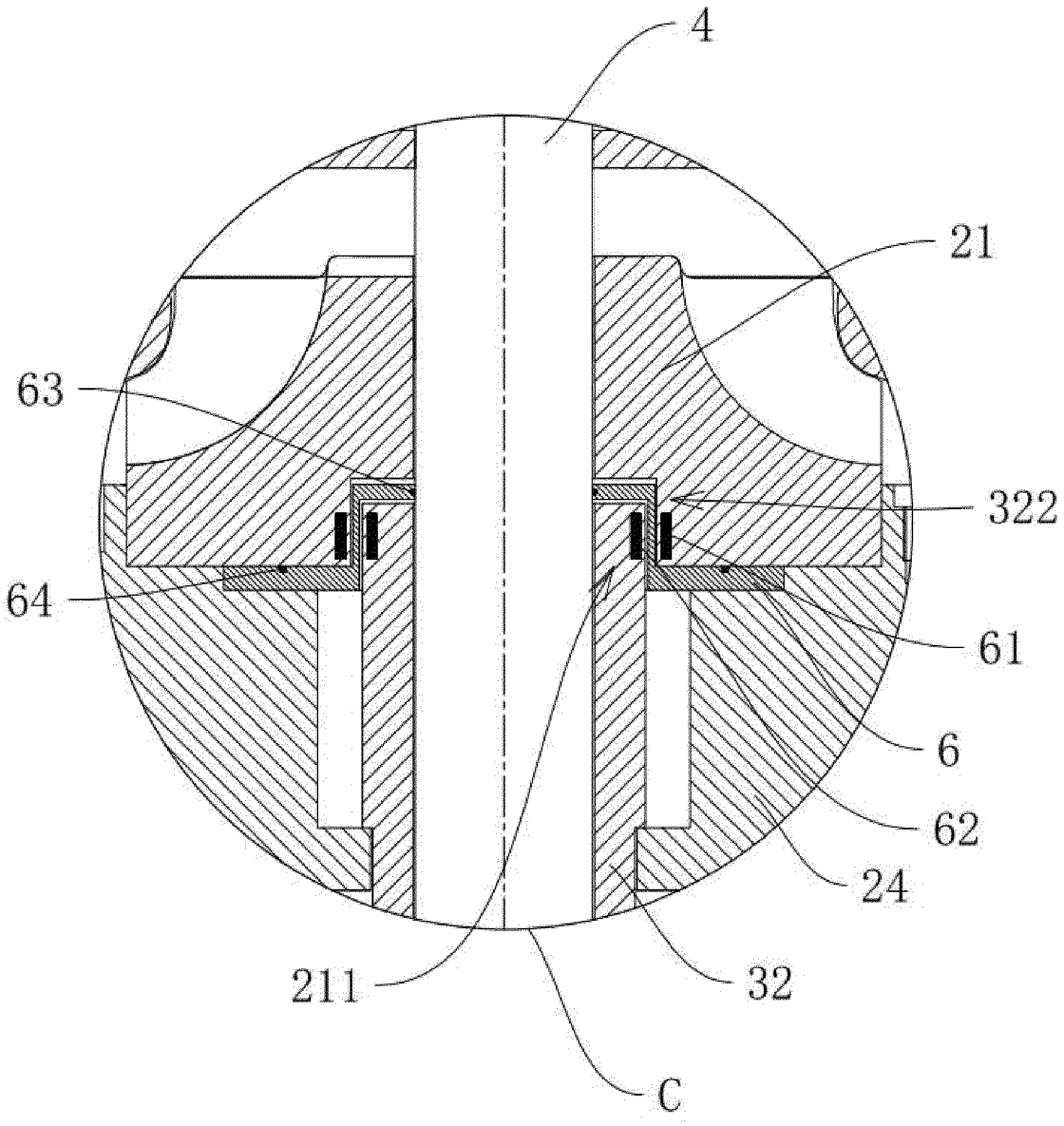
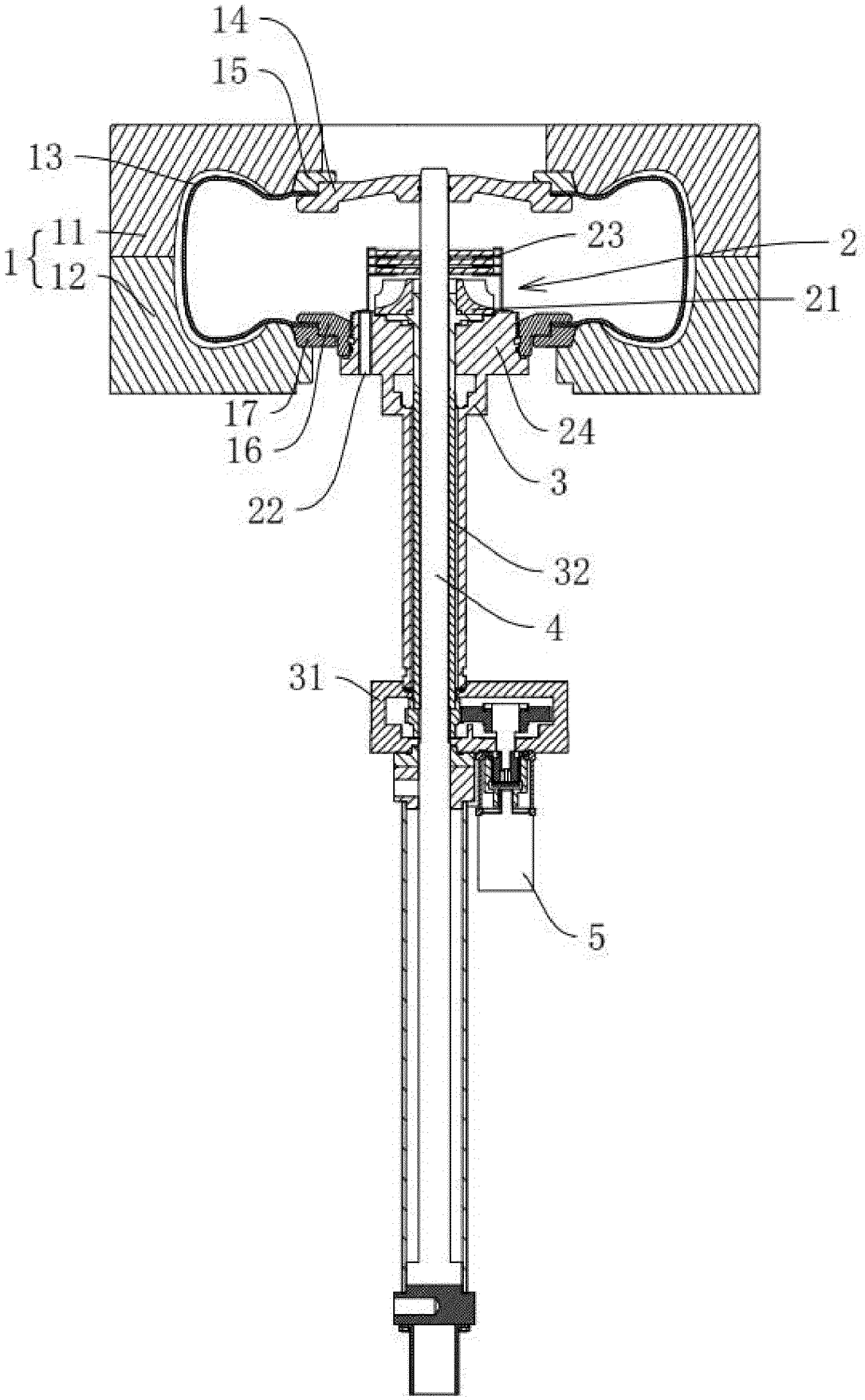


FIG. 7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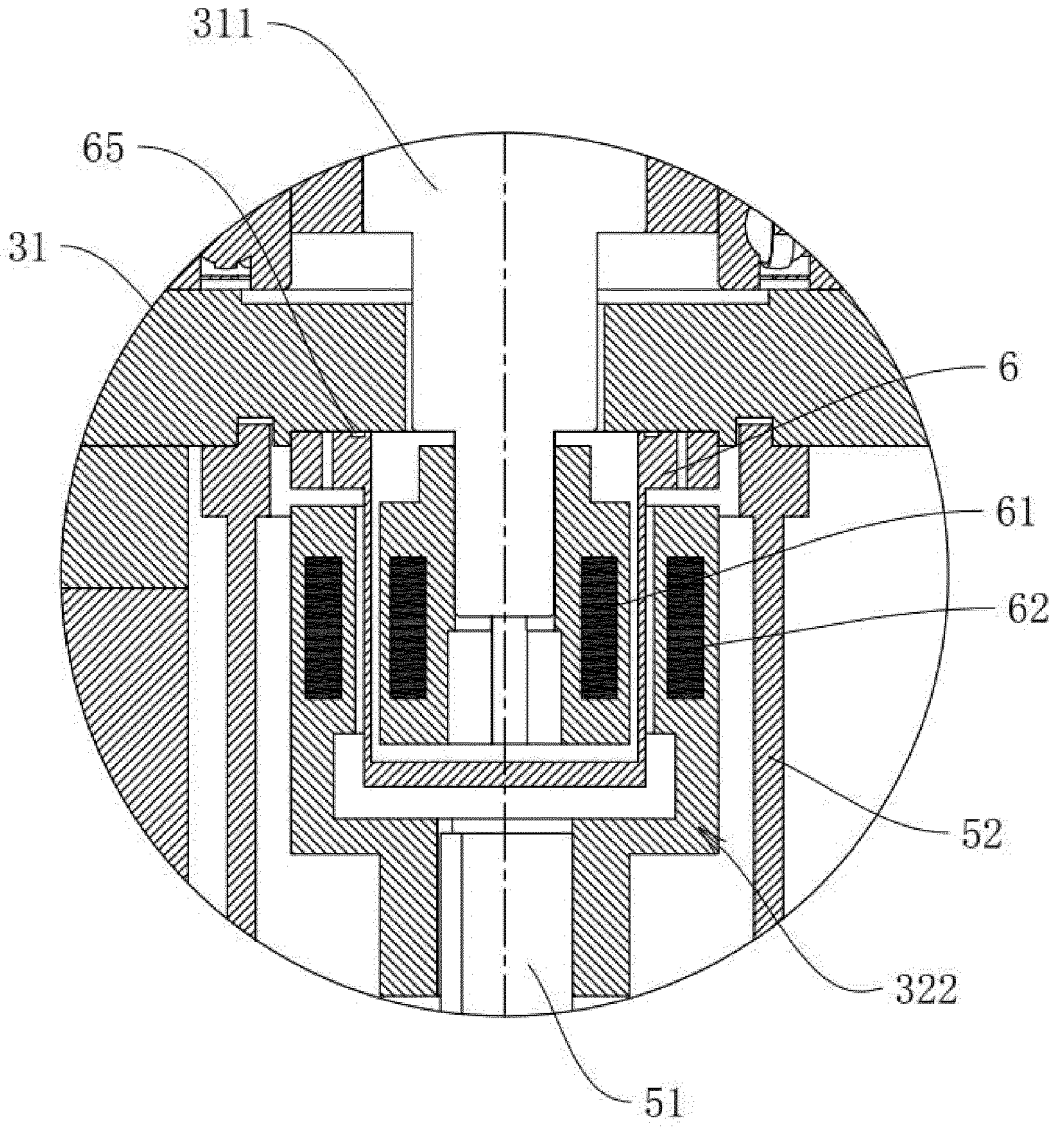

FIG. 9

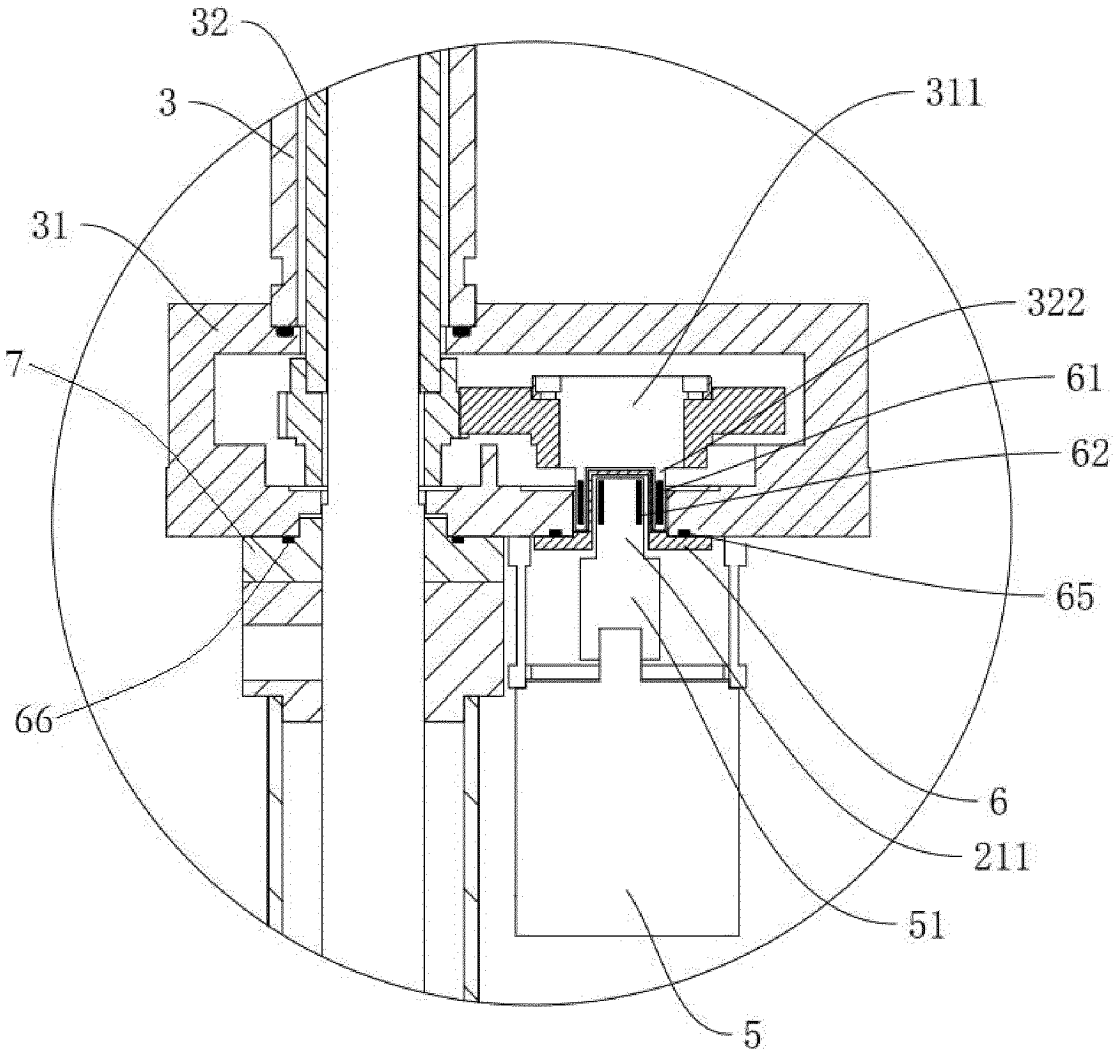

FIG. 10

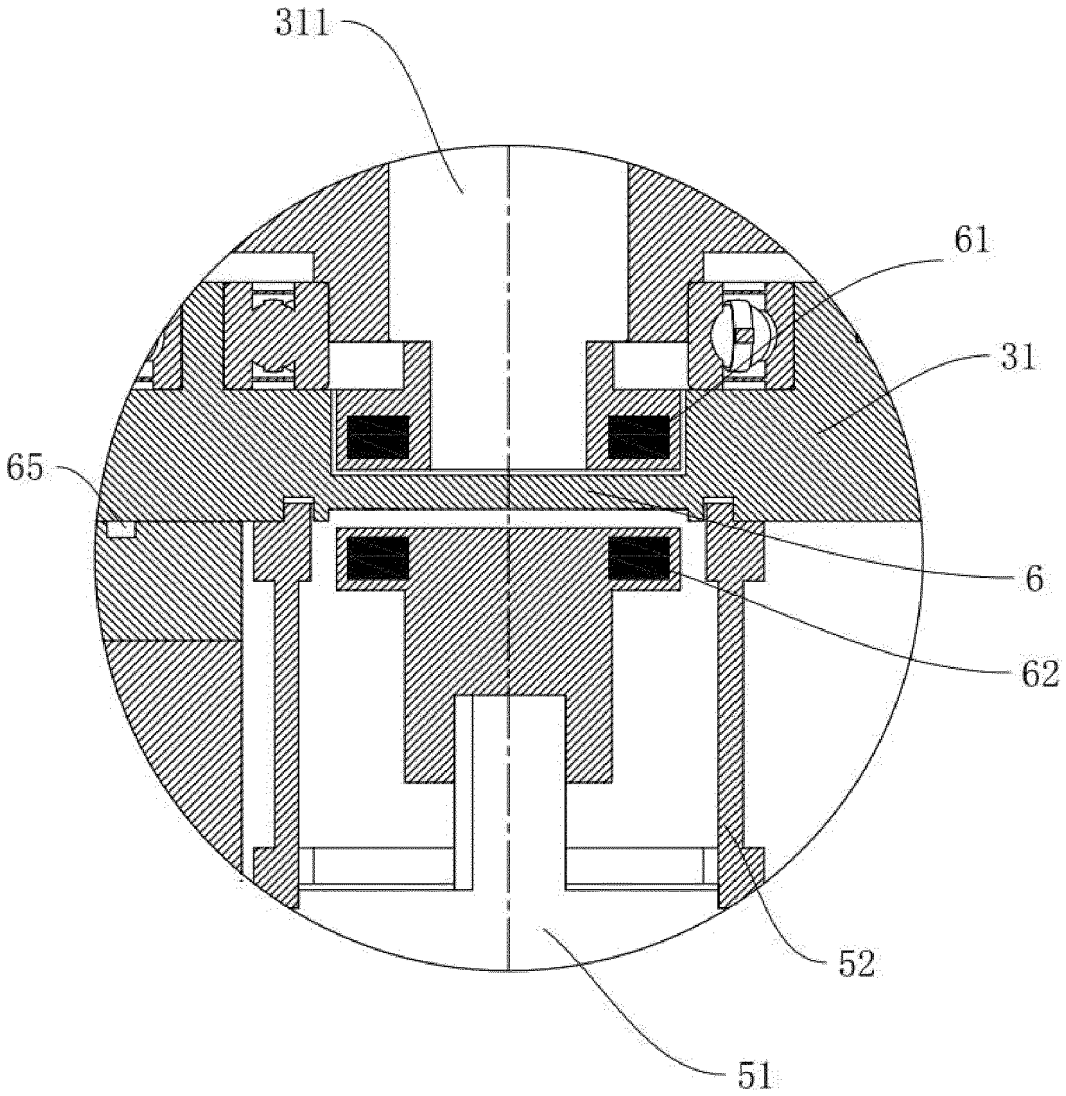

FIG. 11

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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